

Indiana Department of Environmental Management

Issue Paper

Nitrogen Oxides (NO_x) Allowance Allocation Methodology Approaches and Options

Introduction

This paper discusses allowance allocation methodology approaches and options for a state rule to implement the EPA's NO_x Budget Trading Program (model rule), which was published as Part 96 in the Final NO_x SIP Call rule (63 FR 57356, October 27, 1998).

The emissions trading program contained in the federal NO_x SIP Call regulation is not mandatory. States can choose other regulatory mechanisms to meet the federal NO_x SIP Call requirements.

Advantages for participating in EPA's trading program include:

- 1) It encompasses sources from 22 states. When a greater number of sources participate, the trading market is more robust and the whole program more cost-effective.
- 2) Sources in Indiana subject to EPA's findings under Section 126 of the Clean Air Act (25 of Indiana's 94 utility units) are already required to participate in EPA's trading program.
- 3) A number of Indiana utilities are owned by companies that also own units in other SIP call states. Participation in EPA's regional trading program would simplify compliance plans for those companies and enable cost-effective pollution controls.
- 4) States that adopt EPA's trading program with only those variations contemplated in the model rule will have a streamlined federal approval process.
- 5) Administration of most aspects of the trading program by EPA will assure consistency and will reduce the administrative burden on the regulated sources and the state.

It can also be argued though that participation in the federal model trading rule without restrictions on trading may result in needed local NO_x reductions not occurring within the state.

EPA has allowed variations from the model rule in the areas of applicability, early reduction credit methodology and the NO_x allowance allocation methodology. Other areas of importance in the

model rule are the emissions monitoring and reporting and banking. No variations are allowed in these areas.

Model Rule Allowance Allocation Methodology

The model rule includes an allowance allocation methodology. As a starting place, IDEM has included this methodology in Section 10-4-9 of the October 6 draft rule. States may adopt an alternative allocation methodology so long as the allowance allocations do not exceed the emissions trading budget, new sources are required to hold allowances and the timing requirements for the submission of allowances to EPA are met. With regard to the timing requirements in the federal rule, states must allocate a minimum of one control period of allowances at least three years in advance. If a State fails to submit allowances for a control period before the deadline, EPA will issue allowances based on the previous control period.

Basically, states therefore have the ability to vary:

- 1) The basis on which initial and future allowances are allocated, as long as they do not exceed EPA's cap;
- 2) The number of allowances, if any, to be set aside for either new sources or energy efficient projects;
- 3) The duration of the allocation (i.e., will a source get the same amount of allocations for one, two, three or more years before they are recalculated?);
- 4) How far in advance allowance allocations will be made.

Federal Model Rule

The federal model rule allowance allocation methodology is heat input based. The rule includes separate tracks to calculate the allowances for the electricity generating units (EGUs) and the non-electricity generating units (non-EGUs). The calculation mechanism is the same for both EGUs and non-EGUs. However, certain parameters that determine the allowances, (e.g., the budget, emission rates and heat input data) are different.

For EGUs, the initial allowances (for the control periods 2003, 2004 and 2005) are calculated based on an emission rate equal to 0.15 lb. /mmBtu and heat input which is an average of the two highest heat inputs in the year 1995, 1996 and 1997 control periods, assuming 17% growth through 2007.

The initial allowances for non-EGUs are calculated based on an emission rate equal to 0.17 lb. /mmBtu and heat input in the 1995 control period, also assuming growth through 2007.

The allowances for both EGUs and non-EGUs for the subsequent control periods (2006 and later) would be calculated based on each unit's heat input in the control period which is four years before the control period for which the allowances are calculated. For example, control period 2002 is used to calculate the allowances for the 2006 control period

To address new sources, the federal model rule sets aside, separately for new EGUs and non-EGUs, a budget which is equal to 5% of the trading budget for each of the 2003, 2004 and 2005 control periods and 2% of the trading budget for each of the subsequent control periods (2006 and later). The allowances are adjusted upwards or downwards until the NO_x trading budgets adjusted for new source set-asides are met. Any new EGUs are allocated allowances from the new source set aside on a first-come-first served basis.

In the federal model rule, the new source allocations are based on emission rates equal to 0.15 lb. /mmBtu, the unit's maximum design capacity in mmBtu/hr and the unit's operation in the first control period when the new unit operates. At the end of the control period, the unit's allowances are deducted based on the actual utilization and the unused allowances are allocated to the existing units on a pro-rata basis. The allowance calculation mechanism for new non-EGUs is the same except that the allowances are based on an emission rate equal to 0.17 lb. /mmBtu.

State Options

The States' emissions trading rule must include an allocation section. Certain parameters that may alter the model rule language and/or result in different allocations are discussed below.

1. Allowance allocation basis (output vs. input-based approach)

There are several ways the trading budget can be distributed in the form of allowances to the sources in the emissions trading program. Commonly, allowances for a source in the trading program are calculated as a product of a parameter that represents source's emission per unit of its activity and the amount of its activity over a given period of time. For example, for EGUs, pounds of NO_x per unit heat input or electricity produced and a parameter which represents its activity over a given time period (for example, total heat input or electricity produced during the ozone season control period) are used. These parameters can be input-based (for example, lbs. NO_x/million Btu heat input and the total heat input in million Btu) or output-based (for example, lbs. NO_x/megawatt-hour and the total electrical energy in megawatt-hours, over a given period of time).

An output-based approach to allowance allocation is often advocated as a way to achieve ancillary environmental benefits, lower emission control costs and lower fuel use than a heat input approach. The ability to sell surplus allowances provides the sources incentive to improve efficiency in the generation, supply and distribution of the product (electric energy, steam or hot water).

The model rule allocation basis is heat input-based. EPA allows States to adopt an input or an output-based approach. If an output-based approach is adopted, it would alter the model rule language and it may also result in allocations to sources that are different from those that are based on a heat input-basis. However, several procedural and data related issues have been identified in adopting this approach in the near future.

EPA, in its recent rulemakings (NOx SIP Call and Section 126), has adopted an input-based approach to allocate initial allowances. In its Section 126 action, EPA used a heat-input based approach to allocate initial allowances (for the 2003 to 2007 control periods) and committed itself to adopting rules that will allocate allowances using an output-based approach starting in the 2008 control period. The EPA's reasons for not initially adopting an output-based approach in the NOx SIP Call were that:

- (1) an output-based approach has not been fully developed or made available for public comment;
- (2) before issuing a model output approach EPA would need to make changes to the current monitoring and reporting requirements. EPA would have to revise Part 75 to monitor and report temperature, pressure and steam output for units with some or all of their output as heated steam.

The reasons for not issuing NOx allowances based on output in Section 126 action were listed as:

- (1) the heat input data have been subject to more extensive public review than the output data;
- (2) in many cases, for electric generating units, the output data are based on the plant level output data, apportioned to the units based on heat input data. EPA points out that the measured actual heat input data are more accurate than the output data that are based on heat input apportionment; and
- (3) a complete set of output data for cogenerators is not available.

In its Section 126 Rulemaking, EPA states that since the initial allocation is based on historical data and so reflects only actions taken, it would not provide any incentive for future actions. Therefore, basing initial allocations on output as opposed to input would not result in any additional air quality benefits, changes in emission control costs, or market decisions.

States can adopt rules that would allocate initial allowances on heat input basis and adopt EPA's output based approach when it is finalized. Alternatively, states may adopt output-based rules, using as references, other States programs (Massachusetts and New Jersey) that have adopted an output-based approach and EPA's output-based allowance allocation guidance that it published in May 2000. The former approach would avoid the duplication of effort and save States the resources they need to complete NOx SIP Call rules submission.

2. Emission rates and heat inputs

States can use emission rates and heat input data to calculate allowances differently from the model rule. States can base allowances on emission rates that take into account source specific conditions. States can also base their allowances on heat inputs from more or different control periods than are included in the model rule. This approach could account for unusual operating conditions that occurred in one or more control periods between 1995 and 1997.

3. New source set asides

The model rule sets aside some allowances to be given to new sources. The set-asides are 5% of the trading budget for the 2003, 2004 and 2005 control periods and 2% for the subsequent control periods. The model rules set -asides are based on EPA's Integrated Planning Model (IPM) growth projections for the twenty -three jurisdictions trading region. The IPM projected a one-half percent (1/2%) annual growth in capacity utilization for new sources. Given the timing and optional allocation methodology in the model rule the 2003, 2004 and 2005 control period set-asides would have to accommodate new sources that commence operation after May 1, 1995. Therefore, a 5% set-aside for these control periods was considered large enough to accommodate all new sources for the 2003, 2004 and 2005 control periods. After 2005, the set-aside would need to accommodate new sources that commence operation after May 1 of the year of which is three years before the control period for which the allowances are allocated. Therefore, a 2% set-aside was considered large enough to accommodate sources that commence operation after May 1, 2003.

Allowances from the set-aside that are not issued to the new sources in the applicable period would be allocated to the existing sources in the State on a pro-rate basis. States have the option to include a smaller or larger new source set-aside or no set-aside. If there is no set aside, new sources would have to purchase allowances on the open market. States also have the option to not return the remaining allowances to the existing units. Instead, the allowances can be banked so long as the requirements for banking are met.

Many options exist for creating new source set-asides. IDEM will identify specific options upon completion of a review of NOx emissions permitted to date since 1997. The pool of allowances set aside for new source purposes could also be used to provide other incentives, energy or environmental, to affected entities or to others as well as to new sources.

4. Energy Efficiency and Renewable Set-aside

The model rule does not have a set-aside for energy efficiency or renewable energy projects. In the Supplemental Notice of Proposed Rule making (63 FR 25902, May 11, 1998) EPA noted that there were several difficulties in designing an energy-efficiency program that would encourage actions that would not otherwise occur without the program and maintain the integrity of the NOx cap. Instead of proposing an energy efficiency set-aside program in the proposed rule, EPA raised the following questions that should be discussed and addressed:

1. How to design a system that encourages energy efficiency and renewable improvements above and beyond those that are currently incorporated?
2. What should be the size of the set-aside? Optimal size might be such that it encourages energy efficiency projects but not so large that the allowances go unallocated. EPA analysis shows that a set -aside pool in the range of 5% to 20% of the EGU budget could be considered.
3. What applicants and what projects should be considered eligible to receive allowances from the set-aside? How many applications could a State reasonably review? What should be the timing of application for the projects to be considered and how would the entities apply?

4. What should be the length of allowances that provides incentives for incremental projects but does not limit the availability of allowances for future projects?
5. What should be the verification procedure that is not too complex and fits the type of measure and entity?

The States of Massachusetts and New York have included an energy-efficiency set-aside in their rules. The New York rule set-asides are: 5% of the EGU budget for EGUs, 15% of the non-EGU budget for non-EGUs and 5% of the cement kiln budget for cement.

5. Allowance timing (duration)

EPA's allowance allocation requirements were mentioned above. Allowances for a minimum one control period and at least three years in advance must be submitted. However, states can choose to have allocations last longer—up to 30 years. A short duration allowance allocation system would allow frequent updates to adjust for changes in power production and distribution and would allow new sources to be incorporated more quickly. This could, in turn, reduce the need for a large new source set-aside. Such a system would also allow a quick switch over from an input-based approach to an output-based approach. However, a short duration allocation system provides less certainty for sources.

6. Retired units

The model rule exempts retired units from certain NOx Budget Trading Program requirements such as emissions monitoring and reporting. The exemption begins on the day the unit permanently retires. Within thirty (30) days of the unit ceasing its operation the NOx Authorized Account Representative (AAR) must notify the State of the unit's retirement. The State must amend the operating permit and notify EPA of unit's status as exempt. The records must be kept on site to verify the exempt status of the unit. A retired unit could continue to hold NOx allowances previously allocated or be allocated NOx allowances in the future depending on the allocation provisions adopted by the State. If a retired unit is to resume operation the AAR must submit a permit application no less than 18 months prior to the date on which the unit is first to resume operation. If a retired unit resumes operation, EPA automatically terminates its exempt status. States have the option not to issue allowances to the retired units.

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